

February 1, 2005
VIA ELECTRONIC FILING

Ed Thomas
Chief, Office of Engineering and Technology
Federal Communications Commission
445 12th Street, SW
Washington D.C. 20554

RE: Balancing high power and low power uses in the 3650-3700 Mhz band ET Docket No. 04-151

Dear Mr. Thomas,

We write to draw the Commission's attention to issues pertaining to a proceeding currently under review, 04-151. After reading the comments filed in this docket, we feel compelled to offer a viewpoint alluded to in the record (in comments filed by New America Foundation, et al, to which we were a party). We would like to clarify a set of issues we understand will merit special consideration before the order is written.

We feel that it is imperative to present a clear picture, from the point of view of noncommercial wireless broadband providers, of how a balance can be struck between high power and low power devices to maximize spectral efficiency in the band under discussion, 3650-3700 Mhz.

We strongly support the Commission's expressed intent of permitting unlicensed access with both low power and high power uses in this band. However, in practical application, our experience deploying low-power and "high-power" systems in the existing 2.4 Ghz and 5.8 Ghz shows that there are challenges to providing low-power, mobile and stationary mesh uses in the same band where high power transmission (up to 25W) would also be permitted in an unlicensed environment. A single high power, omni-directional antenna placed at a highpoint in a service area could easily knock out all of the low-power uses in its path. We strongly reject any resolution in this proceeding which permits such a "broadcast" high power transmission - particularly in crowded areas like cities and residential suburbs. This would defeat the object of extending low power functionality, particularly mesh networking such as that practiced by the Champaign-Urbana Community Wireless Network, as a significant use in the band. It would also, in many areas, require providers to offer a technologically inferior (and less spectrally efficient) "hub-and-spoke" network as opposed to a low-power mesh solution.

We also note that there are places where mesh and hub-and-spoke should be deployed together for the best results. For example, Southern California Tribal Digital Village (TDV) uses a hub-and-spoke architecture to connect resource centers in 18 tribal reservations scattered over an area of several hundred square miles. TDV is now investigating the possibility of deploying a mesh network which would extend the reach of connectivity from the resource center to individual

homes and other buildings in each of the reservations within the Southern California Tribal Digital Village. Our discussions in the community wireless community lead us to believe that in many places, some people will need a mesh architecture, some will need a hub-and-spoke architecture, and some will want both architectures to work with each other.

We believe that the high power devices in this band must therefore be geared for backhaul and very narrow point-to-point links. Ideally, the 3650-3700 Mhz band would be used for low power networking in densely populated urban areas, as well as towns and small cities in rural areas. High power devices would be permitted exclusively in rural areas, as defined by other Commission proceedings, measured according to population density. Further, they should use pencil-then beam formation for point-to-point links between base stations or repeaters. Further, they should be placed on towers or other locations with altitude well above that of neighborhood rooftops. This will avoid the potential interference of a high power beam cutting across the bow of a low power network. Devices should contain geo-location mechanisms designed to cease transmission while within the exclusion zones surrounding incumbent satellite uplinks or in densely populated urban areas. The premise here is to open up the band for high capacity, low power networking in rural areas while providing opportunities for backhaul between rural population centers. In communities without convenient or affordable access to fiber backhaul, this band will become extremely useful. High power uses, restricted as described, will maximize spectral efficiency without harming the unlicensed environment for low power services. It will permit a web of rural communities with low power networks interconnected with high power backhaul using point-to-point links.

This leaves a final problem of coordinating the high power devices to minimize interference without burdening the Commission with a licensing regime and effectively eliminating the highly desirable assets of the unlicensed environment. We strongly oppose any licensing of high power devices or a spectrum coordination scheme that effectively establishes a "first in time, first in right" regime. We believe that there are technological solutions to the problem of spectral coordination between high power transmitters that seek to occupy the same space. High power devices regulated in the manner described above would be able to coexist on towers, tall buildings, grain elevators, and mountaintops without great difficulty. With a minimum of good faith negotiation, the placement of backhaul transmitters could be accomplished. Using dynamic frequency adjustment built into the devices, physical shielding, and engineering solutions for placement, we do not foresee the interference potential for high power backhaul to be so great as to challenge the efficacy of the Part 15 rules.

We propose that the Commission maintain an informational database where the coordinates of high-power transmitters can be registered so that new market entrants can plan their networks accordingly. Each high-power device could include a package insert with information on how to register in the database. We think this kind of voluntary solution will work better than requiring registration and creating a "land rush" by protecting first in time users. Since rural areas that would have access to high power will have relatively few users of high-power base stations, and everyone has an incentive to avoid interference, we believe that parties will generally negotiate in good faith - especially if the Commission refuses to arbitrate disagreements and requires users to "work it out" on their own.

We hope this submission is helpful. If there is any more information we can provide, or any other way we can be useful, please contact Sascha Meinrath, Project Coordinator for the Champaign-Urbana Community Wireless Network (Sascha@ucimc.org) and Matthew R. Rantanen, Director of Technology, Southern California Tribal Digital Village (mrantanen@sctdv.net). If it is easier, feel free to contact Harold Feld of Media Access Project (hfeld@mediaaccess.org), which is representing us in this matter, or Ben Scott of Free Press (bscott@freepress.net).

Sincerely,

Sascha Meinrath
Project Coordinator
Champaign-Urbana Community Wireless Network

Mathew R. Rantanen
Director of Technology
Southern California Tribal Digital Village